UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,722	05/16/2005	Evy Reitan	770033.401USPC	9705

500 7590 04/29/2008

SEED INTELLECTUAL PROPERTY LAW GROUP PLLC
701 FIFTH AVE
SUITE 5400
SEATTLE, WA 98104

EXAMINER	
WOOLWINE, SAMUEL C	

ART UNIT	PAPER NUMBER
1637	

MAIL DATE	DELIVERY MODE
04/29/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/509,722	REITAN ET AL.	
	Examiner	Art Unit	
	SAMUEL WOOLWINE	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21 and 23-25* is/are pending in the application.

4a) Of the above claim(s) *16-21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 23-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01/24/2008* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status

Applicant's reply filed 01/24/2008 is acknowledged. Claims 1-21 and 23-25 are pending. Of these, claims 16-21 remain withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 05/10/2007.

Applicant's request for rejoinder of the withdrawn claims based upon amendments asserted to establish unity of invention is denied, as the elected claims are still rejected over the prior art (see below).

The rejections made in the previous Office action (OA 07/24/2007) under 35 U.S.C. 112, 2nd paragraph, are withdrawn in view of Applicant's amendments.

The rejections made in OA 07/24/2007 over Kuroita et al (USPN 5,990,302) and Hewitt (EP 0261955 A2) are withdrawn in view of Applicant's amendment, as Kuroita teaches explicitly the use of an acidic pH and there is no apparent reason why one would have modified Hewitt's method to arrive at a pH of 8.5-9.5 based on Hewitt's disclosure alone.

New rejections are set forth below, necessitated by Applicant's amendment.

Response to Arguments

Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.

Drawings

The replacement drawings received on 01/24/2008 are objected to because the figure contains a key which indicates the lines corresponding to 50ul, 100ul and 150 ul blood, but the graph itself indicates 50ul blood for the line which the figure key indicates corresponds to 150ul blood. It is not clear what the meaning of this text in the graph is meant to indicate, and appears to have been erroneously included. Applicant is advised to either delete the "50ul blood" text from the graph, or else explain the discrepancy between the graph and the key. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites the limitation "wherein the NH_4^+ or NH_3 is present during the lysis step". There is insufficient antecedent basis for this limitation in the claim. The claim depends ultimately from claim 1, which recites a *source* of NH_4^+ or NH_3. This is how the claim will be interpreted for purposes of examination over the prior art. This is a new grounds of rejection, necessitated by Applicant's amendment to claim 1.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim1-5, 7, 8, 11-13 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Sauer et al (WO 99/61603).

With regard to claim 1, Sauer teaches *a process for isolating nucleic acid from a nucleic acid-containing sample, which comprises:*

(a) providing a chaotrope (see abstract; see page 6, first paragraph);

(b) providing a nucleic acid binding solid phase capable of binding nucleic acid in the presence of the chaotrope (see abstract; see page 6, first paragraph);

(c) providing a source of NH_4^+ or NH_3 (see page 7, first paragraph: Sauer teaches adjusting to the desired pH using amino acids; amino acids are a "source of NH_4^+ or NH_3" as they could release ammonia by the action of amino acid deaminases; to consider these amino acids as "sources" is consistent with Applicant's specification as filed, page 6);

(d) contacting the sample with the nucleic acid binding solid phase in the presence of a liquid phase comprising the chaotrope and the source of NH_4^+ or NH_3 (see abstract; see page 6, first paragraph)

wherein the liquid phase has a pH in the range of 8.5 to 9.5 (see page 6, first paragraph: Sauer teaches a pH of "at least 9 or about 10"; see page 7, first paragraph: Sauer teaches adjusting the pH "from 8 to 12, more preferred 9 to 11, in particular about 10"; 9 is within the claimed range);

and (e) optionally separating the solid phase with the nucleic acid bound thereto from the liquid phase (see page 8: "washing of the silica material").

With regard to claim 2, Sauer teaches eluting the nucleic acid from the solid phase (see page 8: "elution of the plasmid DNA from the silica material").

With regard to claim 3, Sauer teaches a cell lysate, which is a biological sample (see page 8: "cell lysis").

With regard to claim 4, Sauer teaches a cell lysate, which is a cellular sample (see page 8: "cell lysis").

With regard to claim 5, Sauer teaches a cell lysis (see page 8: "cell lysis").

With regard to claims 7 and 8, Sauer teaches isolation of plasmid DNA, which is double stranded (ds) DNA (see page 6, 2nd paragraph).

With regard to claim 11, Sauer teaches guanidinium, urea, perchlorate and thiocyanate (see page 6, 4th paragraph) and iodide (page 9, last paragraph).

With regard to claim 12, Sauer teaches a silica-based solid phase (see abstract; see page 6, first paragraph).

With regard to claim 13, Sauer teaches magnetic silica material (page 6, last paragraph).

With regard to claim 15, Sauer teaches one solution comprising the chaotrope (in this case, sodium thiocyanate, and the source of NH_4^+ or NH_3 (in this case, amino acids) (see page 7, second paragraph). Sauer also teaches binding buffers containing both a chaotrope (NaSCN) and source of NH_4^+ or NH_3 (glycine) (see page 15, "Binding Buffer (PB)"). Although in these particular examples the pH was 9.6, as noted above, Sauer teaches a range of pH, specifically reciting 9-11; 9 is within the claimed range.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-9, 12-15 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over McKernan (US 2002/0106686 A1, filed Jan 9, 2002) in view of Rauth et al (WO 01/19980 A1) as evidenced by Horne et al (Analyst, 1999, 124:87-90) and by Alleman (Free Ammonia-Nitrogen Calculator & Information [online], 24 December 1998, [retrieved on July 18, 2007], retrieved from the Internet: <cobweb.ecn.purdue.edu/~piwc/w3-research/free-ammonia/nh3.html>, prior art of record). As the Rauth reference was published in German, US Pat 7,022,835, which issued from thus PCT application filed under 35 U.S.C. 371 will be relied upon as a translation, and all teachings will be pointed out with reference to the '835 patent.

With regard to claim 1, McKernan teaches *a process for isolating nucleic acid from a nucleic acid-containing sample, which comprises:*

(a) providing a chaotrope (see paragraphs [0011] and [0060]: the salts listed therein are chaotropes);

(b) providing a nucleic acid binding solid phase capable of binding nucleic acid in the presence of the chaotrope (see paragraph [0007]: "first reagent"; see paragraphs [0011] and [0060]);

(d) contacting the sample with the nucleic acid binding solid phase in the presence of a liquid phase comprising the chaotrope (see paragraphs [0007], [0011] and [0060])

wherein the liquid phase has a pH in the range of 8.5 to 9.5 (see paragraph [0014]: McKernan teaches optimizing the pH throughout a range of 2-11);

and (e) optionally separating the solid phase with the nucleic acid bound thereto from the liquid phase (see paragraph [0007]: "(d) removing the carrier having bound thereto the first species of nucleic acid molecule from the first combination").

With regard to claim 2, McKernan teaches eluting (see paragraph [0043], for example).

With regard to claims 3-5, McKernan teaches isolating nucleic acid from a cell by lysing the cell in the presence of the first reagent comprising the solid phase and chaotrope (see paragraphs [0007], [0011] and [0060]).

With regard to claims 7, 8 and 9, McKernan teaches these types of nucleic acid (paragraph [0067]).

With regard to claim 13, McKernan teaches magnetic solid phase (paragraph [0012]).

With regard to claim 23, McKernan teaches single stranded (ss) DNA (paragraph [0067]).

McKernan does not teach providing a source of NH_4^+ or NH_3 as recited in claim 1, or that the NH_4^+ or NH_3 is present during the lysis step as recited in claim 6. McKernan does not teach providing the NH_4^+ or NH_3 as a solution of ammonia (claim

14) or that the NH_4^+ or NH_3 and chaotrope are provided together as a solution (claim 15). McKernan also does not teach silica as the solid phase (claim 12).

It is noted that McKernan teaches a method for the isolation of nucleic acids by binding them to a solid phase in the presence of a chaotropic salt (i.e. those listed in paragraphs [0011] and [0060]) and a "precipitating agent", most preferably polyethylene glycol (PEG; see paragraphs [0007] and [0010]).

Rauth also teaches isolation of nucleic acids by binding them to a solid phase in the presence of a chaotropic salt and PEG (see column 5, lines 4-14 of the '835 patent). The chaotropic salts listed by Rauth include the chloride salts of Li, Na, K, Cs, Mg, Ca and Ba (all of which are also listed by McKernan).

With regard to claims 1, 6, 14 and 15, Rauth also lists the chloride salts of Rb, Fr, Be, Sr, Ra and NH_4 (ammonium) as alternatives. Note also that Rauth refers to all these salts as chaotropic (see column 8, lines 30-37).

Furthermore, the chloride ion can be considered a chaotrope, as evidenced by Horne et al, who state at page 89, column 2, second full paragraph: "Common chaotropic ions used are chloride, iodide, perchlorate and thiocyanate ions with chloride being one of the weaker types." Thus, although weak, chloride is still a chaotrope.

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to substitute ammonium chloride for the chloride salts listed by McKernan when practicing his method, since Rauth, who teaches a similar method, teaches ammonium chloride as an equivalent salt to those taught by Horne. In doing so, one would have arrived at the claimed methods, since ammonium chloride

would provide a source of ammonium and a chaotrope (chloride) (meeting the limitations of claim 1), present in a single solution (meeting the limitations of claim 15), and present during the lysis step taught by McKernan (meeting the limitations of claim 6).

Regarding the obviousness of substituting equivalents known for the same purpose, MPEP 2144.06 states: "In order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant's disclosure or the mere fact that the components at issue are functional or mechanical equivalents." In this case, Rauth clearly establishes that ammonium chloride was an art recognized equivalent of chloride salts taught by McKernan for the purpose of enhancing binding of nucleic acids to a solid phase carrier in the presence of PEG. Furthermore, McKernan states at paragraph [0060]: "The wide range of salts suitable for use in the method indicates that many other salts can also be used and suitable levels can be empirically determined by one of ordinary skill in the art."

Note the Federal Circuit decision in *Pfizer, Inc. v. Apotex, Inc* ., 480 F.3d 1348, 82 USPQ2d 1321 (Fed. Cir. 2007) where the court rejected the notion that unpredictability could be equated with nonobviousness, because there were only a finite number (53) of pharmaceutically acceptable salts to be tested for improved properties. Here, the number of possible alternatives taught by Rauth (Rb, Fr, Be, Sr, Ra and NH_4) was even smaller than the 53 alternatives in *Pfizer*.

With regard to claim 14, any aqueous solution of ammonia (NH_3) will inherently also contain ammonium ion (NH_4^+) and vice versa, since these two species exist in chemical equilibrium. Evidence to support this assertion is found in Free Ammonia-Nitrogen Calculator & Information, by James Alleman, who states: "Free ammonia (NH3-N) and ionized-ammonia (NH4+-N) represent two forms of reduced inorganic nitrogen which exist in equilibrium depending upon the pH and temperature of the waters in which they are found" (first sentence). Thus, using ammonium chloride as the salt in the method of McKernan would have inherently provided a solution of ammonia.

With regard to claim 12, Rauth teaches silica for use as the solid nucleic acid binding phase (column 4, lines 48-57).

It would have been *prima facie* obvious to one of skill in the art at the time the invention was made to use a silica-based solid phase when practicing the method of McKernan, since Rauth, who teaches a similar method, indicates this is a suitable material for use in such a method. See MPEP 2144.07.

Claims 10, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over McKernan (US 2002/0106686 A1, filed Jan 9, 2002) in view of Rauth et al (WO 01/19980 A1) as evidenced by Horne et al (Analyst, 1999, 124:87-90) and by Alleman (Free Ammonia-Nitrogen Calculator & Information [online], 24 December 1998, [retrieved on July 18, 2007], retrieved from the Internet: <cobweb.ecn.purdue.edu/~piwc/w3-research/free-ammonia/nh3.html>, prior art of

record) as applied to claims 1-9, 12-15 and 23 above, and further in view of Laugharn, Jr, et al (US Pat 6,111,096).

As the Rauth reference was published in German, US Pat 7,022,835, which issued from thus PCT application filed under 35 U.S.C. 371 will be relied upon as a translation, and all teachings will be pointed out with reference to the '835 patent.

The teachings of McKernan, Rauth, Horne and Alleman have been discussed. McKernan and Rauth both teach RNA (paragraph [0067] of McKernan; column 5, lines 35-40 of Rauth). Neither teaches specifically "mRNA" (claim 10), "total RNA" (claim 24) or "rRNA" (claim 25).

Laugharn also teaches purification of nucleic acids by binding them to solid phase, including silica (column 1, lines 10-25 and 63-65). Laugharn teaches the desired nucleic acid molecules include total RNA, mRNA (column 2, lines 29-34) and rRNA (column 17, lines 5-10).

It would have been *prima facie* obvious to one of skill in the art at the time the invention was made to use the method of McKernan to purify total RNA, mRNA or rRNA. Firstly, it was known in the prior art to purify these types of RNA. Secondly, one of ordinary skill in the art would have been reasonably expected to conclude from McKernan's general teaching of RNA at least total RNA, which would necessarily include mRNA and rRNA.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAMUEL WOOLWINE whose telephone number is (571)272-1144. The examiner can normally be reached on Mon-Fri 9:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on (571) 272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

scw

/Young J Kim/
Primary Examiner, Art Unit 1637